

ABSTRACT OF THE DISCLOSURE

A plasma processing apparatus is of an internal electrode type, and an inductive coupling type electrode arranged facing a substrate 17 has a shape formed by bending back a conductor at its central portion. A high frequency power is supplied to an end of the electrode so that a standing wave of half wavelength are produced at straight portions formed by bending back the electrode to make an antinode there, and thus a plasma discharge is generated around the electrode. The controlled standing waves with its antinodes positively generated at the straight portions of the electrode are effectively used. The frequency f of the high frequency power is determined by $f = (c / \sqrt{\epsilon_p}) / 2L_1$, where c is the speed of light, L_1 is the length of the portion formed by bending back the electrode, and ϵ_p is the relative dielectric constant of plasma produced around the electrode. The standing waves are positively used to control distribution of density of the plasma in a good situation, and the configuration of the electrode is designed considering the plasma parameters around the electrode.

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